Listing of Claims

1. (Previously Presented) An external housing of a cryocooler, of the type including a heat exchanger, a displacer cylinder assembly and a displacer cylinder primary mover, the external housing comprising:

> a substantially unitary housing arranged and configured to house the heat exchanger, the displacer cylinder assembly and at least a portion of the displacer cylinder primary mover.

2. **(Currently amended)** The housing of claim 1, ~~further~~ wherein the substantially unitary housing comprises~~ing~~ a first section arranged and configured to act as a cold finger and to substantially house the displacer cylinder assembly; a second section arranged and configured to substantially house a heat exchanger; and a third section arranged and configured to substantially house at least a portion of the displacer cylinder primary mover.

3. (Original) The housing of claim 2, further comprising a fourth section arranged and configured to cooperatively attach to an end cap.

4. (Original) The housing of claim 2, wherein the second section is further arranged and configured to matingly engage a vacuum flange.

5. (Original) The housing of claim 4, wherein the combination of the second section and the vacuum flange is arranged and configured to provide structural support for a heat rejector located about the periphery of the vacuum flange.

6. (Original) The housing of claim 5, wherein the first section, the second section and the third section each have a generally round cross section.

7. (Original) The housing of claim 6, wherein the second section has a larger cross section than the first section and the third section has a larger cross section than the second section.

8. (Original) The housing of claim 2, wherein the first section is seamlessly connected to the second section with a first transition section.

9. (Original) The housing of claim 2, wherein the second section is seamlessly connected to the third section with a second transition section.

10. **(Currently amended)** The housing of claim 3~~2~~, wherein the third section is seamlessly connected to the fourth section with a third transition section.

11. **(Currently amended)** The housing of claim 3~~2~~, wherein:

a) the first section is seamlessly connected to the second section with a first transition section;

b) the second section is seamlessly connected to the third section with a second transition section; and

c) the third section is seamlessly connected to the fourth section with a third transition section.

12. **(Currently amended)** A housing for a cryocooler, of the type that includes a heat exchanger, a displacer cylinder assembly and a displacer cylinder primary mover, comprising:

a) a first section arranged and configured to act as a cold finger and to substantially house the displacer cylinder assembly;

b) a second section arranged and configured to substantially house a heat exchanger; and

c) a third section arranged and configured to substantially house at least a portion of the displacer cylinder primary mover; and

wherein at least two of the first section, second section and third sections have different diameters from each other and are seamlessly connected to one another.

13. (Original) The housing of claim 12, wherein the first section is seamlessly connected to the second section and the second section is seamlessly connected to the third section.

14. (Original) The housing of claim 13, further comprising:

a) a first transition section between the first section and the second section; and

b) a second transition section between the second and third sections.

15. (Previously Presented) A cryocooler, of the type used to compress a fluid at a hot end and deliver a cooled fluid to a cold end, comprising:

a) a primary mover;

b) a displacer cylinder operatively connected to the primary mover for compressing ;

c) a heat exchanger; and

d) a substantially seamless housing arranged and configured to support and substantially enclose the displacer cylinder and the heat exchanger, and to support and enclose at least a portion of the primary mover.

16. (Original) The cold end assembly of claim 15, wherein the housing is entirely seamless from a first end to a second end, and wherein the housing is closed at the first end and open at the second end during an assembly stage.

17. (Original) The cold end assembly of claim 16, further comprising an end cap, the end cap sealing engaging the second end of the housing.

18. (Original) A Stirling cycle cryocooler, comprising:

a) a displacer unit;

b) a heat exchanger unit,

c) a compressor and linear motor assembly; and

d) a unitary sealed housing, wherein the housing is arranged and configured to support and enclose at least portions of the displacer unit, the heat exchanger, and the compressor and linear motor assembly.

19. (Original) The cryocooler of claim 18, wherein the housing is entirely seamless from a first end to a second end, and wherein the housing is closed at the first end and open at the second end during an assembly stage.

20. (Original) The cryocooler of claim 19, further comprising an end cap, the end cap sealing engaging the second end of the housing.

21. (Previously Presented) A method of fabricating a ~~cold end assembly for a~~ housing for a cryocooler, comprising:

a) drawing a unitary housing for the cryocooler;

b) machining at least one selected internal diameter of the housing;

c) installing a piston bore assembly proximate at least one of the machined internal diameters;

d) machining at least one selected external diameter of the housing; and

e) installing a vacuum flange proximate at least one of the selected external diameters.

22. (**New**) The external housing of claim 2, wherein at least two of the first, second and third section have different diameters from each other.